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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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EXAMINER

PATEL, ISHWARBHAI B

ART UNIT

PAPER NUMBER

2827

DATE MAILED: 12/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/024,030

Applicant(s)

LOPAC ET AL.

Examiner

Ishwar (I. B.) Patel

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) 7-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election / Restriction

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-6, drawn to a multi-layer printed wiring board, classified in class 174, subclass 260.
 - II. Claims 7-9, drawn to a method of forming a multi-layer wiring board, classified in class 29, subclass 832.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case product as claimed can be made by another and materially different process such the product can be made by making a cavity in the circuit board and filling the cavity with encapsulant or the component may be formed in the via hole instead and covered with adhesive. Further, a conductive pin can be provided instead of the via hole for electrical connection.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, and the

search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with David J. Zoeteway (46,258) on November 18, 2002, a provisional election was made without traverse to prosecute the invention of a multi-layer printed wiring board, group I, claims 1-6. Affirmation of this election must be made by applicant in replying to this Office action. Claims 7-9 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Drawings

6. The drawings are objected to because the figures are improperly cross hatched. All of the parts shown in section, and only those parts, must be cross hatched. The cross hatching pattern should be selected from those shown on page 600-81 of the MPEP based on the material of the part. See also 37 CFR 1.84(h)(3) and MPEP 608.02.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

7. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

Reference numerals, 2100, 2200, 2300 and 2400, as described on page 3, line 26 and page 4, line 1-5, are not shown in figure 3.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 3 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Akram et al., US Patent No. 6,051,878, hereafter Akram.

Regarding claim 1, Akram discloses a multi layer printed wiring board comprising;

a first printed wiring assembly including a printed wiring board, and components mounted on a first surface of the printed wiring board (substrate 140 with semiconductor dice 150, see figure 1, column 6, line 30-60),

the components and first surface being covered by a layer of conformal material (dielectric material 170, see figure 1, column 6, line 60-67); and

a first conductive pattern, which is not a part of the first printed wiring assembly, wherein the layer of conformal material is positioned between the first conductive pattern and the first printed wiring assembly (substrate 116, see figure 1, column 6, line 6-15).

Regarding claim 3, Akram further discloses component on both the circuit board encapsulated by the conformal material as shown inn figure 4, substrate 462 and 440).

Regarding claim 6, Akram further discloses lead on the components, see figure 1.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 2, 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akram et al., US Patent No. 6,051,878, hereafter Akram as applied to claims 1,3 and 6 above.

Regarding claim 2, though Akram is not explicitly disclosing a plated through hole, the electrical connection between two layers or between two circuit board using plated through hole is known in the art and what kind of connecting element to be used will depend upon the specific situation. Further, plated through hole is preferred for better and reliable connection between two layers. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the assembly of Akram with plated through hole for better and reliable electrical connection.

Regarding claims 4 and 5, though Akram discloses chip on the substrate, does not explicitly disclose whether those chips are packaged or unpackaged integrated circuits. However, both the packaged and unpackaged chips installed on the substrates are known in the art and will depend upon the specific requirement and conditions. If the chips are safe enough to withstand the thermal cycling or stress exerted during the life cycle, it may be used unpackaged. Further, if the bonding pads on the chips circuits are too dense, it is advisable to provide a carrier, which will protect the chip as well as will help in the spreading the connection points to be connected with a circuit board. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the assembly of Akram with the circuit board with

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either unpackaged or packaged integrated circuit die in order to have the specific requirement of reliable assembly with lower cost.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lin, Imoto, Takahashi et al., Senba et al., Lee, Kitano et al., disclose assembly similar to applicant's claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (703) 305 2617. The examiner can normally be reached on M-F (6:30 - 4) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L Talbott can be reached on (703) 305 9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305 3431 for regular communications and (703) 305 7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956.

ibp
November 29, 2002.

 12-2-02
ALBERT W. PALADINI
PRIMARY EXAMINER